REMARKS

Reconsideration and allowance are respectfully requested.

Claims 1-2 and 5-16 are pending in the application.

Claims 5, 10 and 16 stand rejected under 35 USC 112, first paragraph. The Examiner states that the limitation in those claims "wherein the laser welding is performed without filler material" is not found in the specification.

Claims 5, 10 and 16 also stand rejected under 35 USC 112, second paragraph.

Applicant respectfully traverses this rejection. In describing the prior art at page 1, last sentence, the specification describes a shortcoming of the prior art, that is "the weld strength of this weld joint is inferior to that of the casting, this circumstance being due to the limited thermal strength of the weld filler material. (emphasis added)" Then, at page 3, first paragraph, in describing an embodiment of the present invention, it specifically states that "the low energy input of the laser welding process will enable a crack free joint to be made between the wall sections in the nickel-base casting materials, with the weld filler metal with inferior strength being dispensable. (emphasis added)"

The Merriam Webster Online Dictionary defines the term "*dispensable*" as "capable of being *dispensed* with" and defines the phrase "*dispense* with" as "to do without". See attached copies of these definitions. Therefore, a person of ordinary skill in the art reading the above descriptions in the specification would readily recognize that the phrase "the low energy input of the laser welding process will enable a crack free joint to be made between the wall sections in the nickel-base casting materials, with the weld filler metal with inferior strength being *dispensable*", means that the "laser welding is performed without filler material", as claimed in claims 5, 10 and 16. That is, no filler material is added to the weld joint between individual wall sections. This prevents the inferior thermal strength of filler material creating an inferior weld strength.

Thus, these claims are fully supported and explained by the specification and it is respectfully requested that these rejections of these claims be withdrawn.

Claims 1-2 and 5-16 stand rejected under 35 USC § 103(a) as being unpatentable over AAPA in view of Cyb '661.

Applicant respectfully traverses this rejection.

The prior art, as exemplified by the AAPA, teaches that welding a combustion chamber of a gas turbine engine from a casting of a highly temperature-resistant nickel-base casting alloy (as claimed in claim 1) results in a weld joint having an inferior thermal strength. See page 1, last paragraph of the specification. A person of ordinary skill in the art, in reviewing the AAPA would not be led to believe that a welding process will result in a high strength combustion chamber of a gas turbine engine made from a casting of a highly temperature-resistant nickel-base casting alloy.

Rather, such person of ordinary skill would be led away from using welding to create such a combustion chamber by the AAPA. See EP '704, disclosed and discussed in the present specification at page 1, first paragraph through page 2, second paragraph. It teaches the use of a nickel-based alloy in the manufacture of a combustion chamber, and is very explicit in stating that a combustion chamber of a nickel based alloy should be cast and not welded because the welding decreases the strength of the combustion chamber. See, page 3, lines 27-30:

> Further, in order to prevent the strength of welding portions from lowering, it is necessary to make a cylindrical member without welding. In order to solve this, the cylindrical member is manufactured by centrifugal casting or lost wax precision casting. By casting it, the cylindrical member which has no large grain size and no welding portion can be attained. (emphasis added)

See also, page 4, lines 37-44:

> In the present invention, a combustor cylindrical liner and a transition piece are made of Fe base alloy, Ni base alloy or Co base alloy. By forming them by casting, high strength is attained, further, since the cylindrical liner body has no welding portion, a strength decrease at the welding portion can be prevented. Since in the gas turbine combustor, the combustion gas temperature has been raised, exceeding 1300° C, and becoming 1400° C, further 1500° C, the combustor itself has been raised in temperature according to the elevation of the combustion gas temperature. Therefore, material of

> higher strength at a higher temperature is desired, the material is possible to provide a structure having no welding portion in the barrel portion . . . (emphasis added)

As is apparent from the citations above, the AAPA (including EP '704) specifically discloses that welding the combustion chamber of highly-temperature resistant nickel-based alloy will reduce its strength. Thus, the AAPA teaches away from the welding of a nickel-based alloy combustion chamber and is in direct conflict with the Examiner's rejection.

This deficiency is not cured by Cyb, which discloses the laser welding of automotive exhaust manifolds. While such exhaust manifolds are exposed to high temperatures, they are not required to endure high mechanical stress, and the mechanical failure of such a manifold, while undesirable, is substantially less significant than the mechanical failure of a combustion chamber of a gas turbine suitable for use in an aircraft. There is no disclosure that the exhaust manifold be manufactured from a material retaining high strength at a high temperature or that the material be a nickel-based alloy, highly-temperature resistant. In fact, Cyb fails to even recognize the problems of welding such alloys, because he does not do so.

Therefore, a person of ordinary skill in the art would not turn to Cyb to cure the deficiencies disclosed in the AAPA, and even if he or she did, would find no disclosure or suggestion that laser welding will prevent the problems of welding highly-temperature resistant nickel based casting alloys, as set forth in the AAPA. There is no disclosure or suggestion in either Cyb or the AAPA, that laser welding individual wall sections of a highly-temperature resistant nickel based casting alloy will produce a result any different than the results noted in the AAPA, that is, welded combustion chambers of compromised strength. A person of ordinary skill in the art presented with the AAPA and Cyb not only wouldn't find claim 1 obvious, he/she would be taught that such a method should not be done. It is impermissible for the Examiner to ignore the teachings of the AAPA, and the deficiencies of Cyb, to find motivation to combine the two in rejecting claim 1. Such motivation to combine cannot come from the present disclosure of Applicant's own invention, used as a roadmap to create a hindsight combination of prior art references.

In view of the above, it is respectfully requested that this rejection be withdrawn.

Claims 2 and 5-16 all ultimately depend from claim 1 and are allowable for the reasons given above with respect to claim 1 and for the further limitations contained therein.

Claims 6 and 11 are also allowable for these further reasons. The Examiner states that whether the laser welding inputs low or high energy is a matter of design choice "wherein no significant problem is solved". As specifically stated at page 3, first paragraph of the specification, "if the casting material is a highly temperature-resistant nickel-base casting alloy, the low energy input of the laser welding process will enable a crack-free joint to be made between the wall sections in the nickel-base casting materials." Thus, this is not merely a matter of design choice; it is the low energy input of the laser welding process that enables a crack-free joint. A high energy input can create cracks in the weld joint of the highly temperature-resistant nickel-base casting materials, thereby weakening the joint and compromising the strength of the combustion chamber. Cyb discloses the laser welding of common automotive exhaust manifolds which do not endure the high mechanical stresses of the claimed combustion chamber. Cyb does not disclose or suggest that the exhaust manifold be manufactured from a material retaining high strength at a high temperature or that the material be a nickel-based alloy, highly-temperature resistant. Therefore, Cyb fails to even recognize the problems that are incurred in welding such highly temperature resistant alloys and certainly fails to disclose or suggest the method claimed in these claims to address the problems of welding such highly temperature resistant alloys. None of the prior art discloses or suggests the method of claims 6 and 11 and it is respectfully requested that claims 6 and 11 be indicated as containing allowable material.

Claims 5, 10 and 16 are also allowable for these further reasons. The Examiner states that performing the laser welding with or without filler material is a matter of design choice "wherein no significant problem is solved". As discussed above with respect to the 112 rejections of these claims, welding the individual wall sections without filler material is not just a matter of design choice. Rather, by laser welding the individual wall sections without filler material, the inferior thermal strength of the filler material cannot jeopardize the strength of the weld. This results in a stronger weld and a stronger combustion chamber. Cyb discloses the laser welding of common automotive exhaust manifolds which do not endure the high mechanical stresses of the claimed combustion chamber. Cyb does not disclose or suggest that

the exhaust manifold be manufactured from a material retaining high strength at a high temperature or that the material be a nickel-based alloy, highly-temperature resistant. Therefore, Cyb fails to even recognize the problems that are incurred in welding such highly temperature resistant alloys and certainly fails to disclose or suggest the method claimed in these claims to address the problems of welding such highly temperature resistant alloys. None of the prior art discloses or suggests the method of claims 5, 10 and 16 and it is respectfully requested that claims 5, 10 and 16 be indicated as containing allowable material.

Claims 8 and 13 are also allowable for these further reasons. The Examiner states that Cyb's laser welding method provides a crack-free joint between cast wall sections. This may be true with respect to the common casting materials used in the automotive exhaust manifolds that Cyb welds. However, Cyb does not disclose or suggest that the exhaust manifold be manufactured from a material retaining high strength at a high temperature or that the material be a nickel-based alloy, highly-temperature resistant. Therefore, Cyb fails to even recognize the problems that are incurred in welding such highly temperature resistant alloys. As specifically stated at page 3, first paragraph of the specification, "if the casting material is a highly temperature-resistant nickel-base casting alloy, the low energy input of the laser welding process will enable a crack-free joint to be made between the wall sections in the nickel-base casting materials." Thus, Cyb does not disclose or suggest a laser welding method "that provides a crack-free joint between cast wall sections" (claims 8 and 13) of a "highly-temperature resistant nickel-based casting alloy" (independent claim 1 from which claims 8 and 13 depend). Improper welding of such alloys can create cracks in the weld joint of the highly temperature-resistant nickel-base casting materials, thereby weakening the joint and compromising the strength of the combustion chamber. None of the prior art discloses or suggests the method of claims 8 and 13 and it is respectfully requested that claims 8 and 13 be indicated as containing allowable material.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance, and such a Notice is earnestly solicited. If any points remain in issue, the Examiner is requested to telephone the undersigned at the number below.

Respectfully submitted,

Timothy J. Klima
Reg. No. 34,852

Harbin King & Klima
500 Ninth Street SE
Washington, DC 20003
Ph: 202-543-6404
Fax: 202-543-6406

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One entry found for **dispensable.**

Main Entry: **dis·pens·able**
Pronunciation: di-'spen(t)-s&-b&l
Function: *adjective*
: capable of being dispensed with
- **dis·pens·abil·i·ty** /-"spen(t)-s&-'bi-l&-tE/ *noun*

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Thesaurus

One entry found for **dispense**.

Main Entry: **dis·pense**
Pronunciation: di-'spen(t)s
Function: *verb*
Inflected Form(s): **dis·pensed; dis·pens·ing**
Etymology: Middle English, from Medieval Latin & Latin; Medieval Latin *dispensare* to exempt, from Latin, to distribute, from *dis-* + *pensare* to weigh, frequentative of *pendere* to weigh, pay out -- more at SPIN
transitive senses
1 a : to deal out in portions **b :** ADMINISTER <*dispense* justice>
2 : to give dispensation to : EXEMPT
3 : to prepare and distribute (medication)
intransitive senses, archaic **:** to grant dispensation
synonym see DISTRIBUTE
- dispense with 1 : to set aside **:** DISCARD <*dispensing with* the usual introduction> **2 :** to do without <could *dispense with* such a large staff>

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